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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/689,814	10/13/2000	Seung-pil Chung	SEC.760	7239

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/19/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/689,814

Applicant(s)

CHUNG ET AL.

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 and 12-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of the invention of group II and species A in Paper Nos. 4 and 6, respectively, is acknowledged.

Claims 1-6 and 12-37 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected invention and/or specie, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 7 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Shinriki et al., U.S. Patent 6,143,081.

Shinriki et al. shows, in fig. 13 and col. 19-lines 11-57, the invention as claimed including an apparatus comprising: a vertically movable susceptor (214,224) installed at a lower portion of a processing chamber, for receiving a wafer W thereon; a heater 280 comprising a lamp and installed at an upper portion of the processing chamber; and a gas diffuser 244 installed below the heater, for supplying reaction gases into the processing chamber.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

-- This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of

35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 7-8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over lida et al., U.S. Patent 5,527,417 in view of Yin et al., U.S. Patent 6,189,484.

lida et al. shows the invention substantially as claimed including an apparatus with a susceptor installed at a lower portion of a processing chamber (see fig. 3), for receiving a wafer 106 thereon; a heater 102 installed at an upper portion of the processing chamber; and a gas diffuser 112 installed below the heater, for supplying reaction gases into the processing chamber (see fig. 3 and col. 9-lines 3-51).

lida et al. lacks anticipation of the susceptor being vertically movable and a cooling line contained within the susceptor. Yin et al. discloses an apparatus with a heating element 170 in the upper portion of the processing chamber whereby the susceptor 137 is vertically movable by an actuator 192 (see Fig. 1 and col. 6-lines 1-21). Furthermore, the susceptor 137 can also contain a cooling line therein (see col. 6-lines 9-11). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of lida et al. so as to include the vertically moving susceptor and cooling line of Yin et al. because this allows for optimization of wafer exposure to plasma, easy removability of the wafer from the processing chamber, and better temperature control of the wafer.

Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over lida et al., U.S. Patent 5,527,417 in view of Shinriki et al., U.S. Patent 6,143,081.

lida et al. shows the invention substantially as claimed including an apparatus with a susceptor installed at a lower portion of a processing chamber (see fig. 3), for receiving a wafer 106 thereon; a heater 102 installed at an upper portion of the processing chamber; and a gas diffuser 112 installed below the heater, for supplying reaction gases into the processing chamber (see fig. 3 and col. 9-lines 3-51).

lida et al. lacks anticipation of the susceptor being vertically movable. Shinriki et al. discloses an apparatus comprising: a vertically movable susceptor (214,224) installed at a lower portion of a processing chamber, for receiving a wafer W thereon (see fig. 13 and col. 19-lines 11-57). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of lida et al. so as to include the vertically movable susceptor of Shinriki et al. because this allows for optimization of the process performed in the apparatus by being able to change the distance between the wafer and the active gas, and removability of the wafer from the processing chamber (see col. 18-lines 6-25 of Shinriki et al.).

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida et al. in view of Yin et al., U.S. Patent 6,189,484, as applied to claims 7-8 and 11 above, and further in view of Shang et al., U.S. Patent 6,182,603.

Iida et al. and Yin et al. are applied as above but lacks anticipation of a gas supply line for receiving the reaction gases supplied via pipes installed outside the processing chamber, the first pipe having a microwave guide for changing a gas mixture containing a hydrogen gas and a fluorine-containing gas in a predetermined ratio, or the hydrogen gas only, into a plasma state, and a second pipe for supplying the fluorine-containing gas into the processing chamber. Shang et al. discloses a first pipe containing a sapphire tube 77 which is coupled to a microwave guide 68 for exciting a gas into a plasma and a second pipe 53 for supplying gas to the processing chamber (see Fig. 1 and col. 4-line 15 to col. 5-line 46). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Iida et al. modified by Yin et al., so as to include the pipe structure of Shang et al. because this will result in the capability of cleaning the apparatus without causing the damage that sometime occurs when generating plasma in the processing chamber (see col. 2-lines 36-62 of Shang et al.).

With respect to the particular gas being transported through the pipes, such limitation is directed to a method limitation instead of an apparatus limitation, and since an apparatus is being claimed the method limitations are not given patentable weight. The method limitations are considered an intended use which does not patentably distinguish an apparatus claim. The apparatus of Iida

et al. modified by Yin et al. and further modified by Shang et al. is capable of supplying the specific claimed gases, through the pipes, to the apparatus.


With respect to the porous plate of claim 9, the Lida et al. reference shows a porous plate forming the bottom of the diffuser, for evenly distributing the reaction gases into the processing chamber, wherein the diffuser is in flow contact with the gas supply line (see fig. 3).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 305-4545. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills, can be reached on 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 872-9310 for regular communications and 872-9311 for After-Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.


Luz L. Alejandro
Patent Examiner
Art Unit 1763

June 14, 2002